

Measuring self-reported health in low-income countries: piloting three instruments in semi-rural Burkina Faso

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Background: National surveys in low-income countries increasingly rely on self-reported measures of health. The ease, speed, and economy of collecting self-reports of health make such collection attractive for rapid appraisals. However, the interpretation of these measures is complicated since different cultures understand and respond to the same question in different ways.

Objective: The aim of this pilot study was to develop a culturally sensitive tool to study the self-reported health (SRH) of the local adult population in Burkina Faso.

Design: The study was carried out in the 2009 rainy season. The sample included 27 men and 25 women aged 18 or older who live in semi-urban Nouna, Burkina Faso. Three culturally adapted instruments were tested: a SRH question, a wooden visual analogue scale (VAS), and a drawn VAS. Respondents were asked to explain their answers to each instrument. The narratives were analyzed with the content analysis technique, and the prevalence of poor SRH was estimated from the quantitative data by stratification for respondent background variables (sex, age, literacy, education, marital status, ethnicity, chronic diseases). The correlation between the instruments was tested with Spearman's correlation test.

Results: The SRH question showed a 38.5% prevalence of poor SRH and 44.2% prevalence with both VAS. The correlation between the VAS was 0.89, whereas the correlation between the VAS and the SRH question was 0.60–0.64. Nevertheless, the question used as the basis of each instrument was culturally sensitive and clear to all respondents. Analysis of the narratives shows that respondents clearly differentiated between the various health statuses.

Conclusion: In this pilot, we developed and tested a new version of the SRH question that may be more culturally sensitive than its non-adapted equivalents. Additional insight into this population's understanding and reporting of health was also obtained. A larger sample is needed to further study the validity and reliability of the SRH question and the VAS and understand which instrument is best suited to study SRH in the low-income setting of semi-rural Burkina Faso.

Keywords: *self-reported health; visual analogue scale; Burkina Faso; sensitivity; adaptation*

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Self-reported health (SRH) is an answer to a single question about perception of one's own health with response categories ranging from 'very good' to 'very poor'. SRH is viewed as a holistic measurement of health, reflecting both physical and mental health, as well as well-being. The World Health Organization recommends SRH for routine use in population studies (1).

SRH is also a useful measurement on an individual level. SRH is a valid (2) and reliable (3) predictor that identifies persons at high risk for adverse health outcomes (4–7) including mortality (8), development of chronic conditions and functional decline (5, 8–9), and health care expenditure (10). Because it is inexpensive, and easy to administer and interpret, SRH is a robust and practical

tool suitable for the clinical environment (11). This is of particular importance for settings with limited resources and large populations.

In low-income countries, the resources of both the general population and healthcare sector are often scarce, diagnostic tools are costly or not available, and the population may suffer the double burden of disease with high prevalences of communicable diseases and increasing prevalences of non-communicable diseases. In these settings, it is crucial to have an accessible, valid, and reliable tool to identify high-risk groups and individuals within the general population for prevention and early intervention. SRH is suggested as such a tool and may be more useful than diagnostic-based tools (8–10, 12–13).

Previously, SRH has been primarily evaluated and used as a risk-assessment tool in high-income countries. Use in surveys in low-income countries increased in the past decade. The 2002–2003 World Health Survey (WHS) is designed to obtain comparable data on health and related determinants across countries in all regions of the world and has utilized a SRH question. Cross-validation to improve comparability of the SRH was also carried out by the Study on Global Ageing and Health (SAGE) launched as part of the WHS in several African and Asian countries in 2002–2003 (14). The WHS and SAGE surveys utilized the SRH question ‘In general, how would you rate your health today? Would you say, very good, good, moderate, bad or very bad?’

The surveys provide some validation for the SRH question and show that SRH is associated with sex, age, marital status, education, and socio-economic status in low-income countries as well as in high-income countries (15–17). However, they also demonstrate that economically advantaged populations tend to report higher levels of poor health than disadvantaged populations in low-income settings (18). Higher socio-economic status is known to be associated with better health. However, the WHS reports (19) and studies based on WHS data (16) show that the prevalence of poor SRH in some low-income countries is lower than in high-income countries (19). For example, the prevalences of bad and very bad SRH in low-income countries of East Asia (e.g. Lao’s Democratic Republic, Myanmar, Vietnam) and Sub-Saharan Africa (e.g. Burkina Faso, Ethiopia, Ghana, Malawi, Mauritania, and Zambia) are lower than in high-income European countries (e.g. Spain, Sweden, and Great Britain). Consequently, it has been suggested that the self-reports of health are not valid for comparing aggregate health among countries, but they may be valid for within-country comparisons (16). However, we believe that this seeming failure of the SRH question should not be as discounted even though within-country reports provide some evidence of validity for the SRH question. These paradoxical results may be explained by low sensitivity of the SRH question in some settings.

Culture (20–23), wording (1), positioning (24), and translation of the SRH question strongly influence the self-reporting of health. Since different people understand and respond to a given question in different ways, the self-reported measures may be misleading without adjustment for these differences (25). Thus, validation of the SRH question in high-income countries does not guarantee valid results in other settings. The use of the SRH in low-income countries should therefore be preceded by a thorough validation and adaptation if required.

Two attempts were made to include a SRH question in an annual household survey (26) in a semi-urban area of Nouna, Burkina Faso. In 2000, a SRH question commonly used in European studies ‘What do you think about your health, is it very good, good, medium, bad, or very bad?’ was translated into the local language. Using this translation, a 3.5% prevalence of poor SRH was found among the adult population (i.e. poor SRH was defined as medium, bad, or very bad SRH). In 2008, a modified version of the SRH question ‘How do you appreciate your health today, is it very good, good, medium, bad, or very bad?’ resulted in an 8.5% prevalence of poor SRH. The unexpectedly low prevalences of poor SRH in 2000 and 2008 (compared to the prevalences of poor SRH in the high-income countries) raised concerns about the sensitivity of both questions. We hypothesized that the questions were unclear to respondents with a resultant underestimation of the prevalence of poor SRH. All those who failed to answer the SRH question in the 2008 Nouna household survey were illiterate, confirming this hypothesis. Visual analogue scales (VAS) have been suggested as a suitable tool to study health (27), particularly in societies with lower levels of education (28, 29). Hence, VAS might be more culturally sensitive instruments to study SRH.

In 2009, a pilot study was launched in Nouna, Burkina Faso that aimed to develop a culturally sensitive tool to study SRH of the local population. The pilot was the first step in a series of studies exploring the use of the SRH as a clinical risk indicator in everyday West African health care. The objectives were to: 1) explore respondent concepts of health and adapt the SRH question to this cultural setting accordingly; 2) test the application of VAS for studying SRH in this setting; 3) study the correlation between the tested instruments and identify the most suitable tool or the combination of tools for studying the SRH in this setting.

Present investigation

Methods

Setting

The study was carried out in Nouna, Kossi Province, Burkina Faso. Burkina Faso is a West African country

with a 2010 population of 16.3 million. Burkina Faso is a low-income country with a life expectancy of 56.7 years. The total adult literacy rate was 26% in 2010 (30). Nouna is a semi-urban area and the administrative capital of the Kossi province, almost exclusively populated by subsistence farmers. The five main ethnicities are Dafing, Bwaba, Mossi, Samo, and Peulh. Although every ethnic group has its native tongue, Dioula is the common language – a lingua franca.

Sample

The sample was derived from a register of the adults who participated in a 2008 household survey. The sampling frame included all persons aged 18 or older, living in Nouna, and belonging to one of the five main ethnicities. This comprised 2308 individuals living in 585 households. Ten households (every seventh household) were systematically sampled from each ethnic group, except for the Samo where 12 households were mistakenly selected using the same technique. One person was interviewed in each of the chosen households and this resulted in a total sample of 52 individuals. An equal number of men and women were ensured by alternating the recruitment of a respondent in each household by sex: if a man responded in the first household, then the interviewer was instructed to ask for a woman in the next household. Participation in the study was voluntary.

Instruments

Three instruments were tested: a SRH question and two VAS. The SRH question was developed by discussion with scientists from the participating universities, Nouna Research Centre, and the interviewers. The majority of discussants could understand and speak at least two local languages. The starting point for the SRH question discussion was the WHO-recommended form ‘How is your health in general: very good, good, fair, bad or very bad?’ (1). The meaning and phrasing in the local languages was discussed. Thereafter, eight alternative phrasings of both the question and the response alternatives were developed and tested on 17 randomly chosen individuals from Nouna. The challenge was to find an all-inclusive word for health and a clear, understandable time reference. The following version was chosen for the pilot: ‘How has your health been since the last rainy season to the current rainy season: very good, good, fair, bad, or very bad?’ The answer required a summary evaluation of one’s health during the past year and included current health status. To describe health in a way common to each ethnic language, the Dioula word ‘keneya’ was used. ‘Keneya’ refers not only to physical or mental health, but is an inclusive health concept of well-being. The common greeting in Dioula is ‘I ka kene?’ and clearly addresses well-being in general rather than being an inquiry into potential current illness. The same

wording for health and the same time anchoring were used in the VAS instruments.

An important technique for asking the SRH question was developed to avoid receiving too many neutral answers. Pre-testing found that the respondents avoided the answer extremes of ‘very good’ and ‘very bad’. Rather, they preferred a neutral alternative of ‘good’. The interviewers were therefore instructed to ask a respondent who answered ‘good’ to specify whether it was ‘good’, ‘very good’, or ‘fair’. Similarly, if respondents said their health was ‘bad’, they were asked whether their health was ‘bad’, ‘very bad’, or ‘fair’.

One VAS, hereafter called a wooden VAS, consists of a small wooden box with 10 extractable wooden cubes (Fig. 1). The box and the cubes represent a person’s health. The 10 cubes represent the best imaginable health and an empty box represents the worst imaginable health. The more cubes in the box, the better one’s health. The process was shown and explained by the interviewer and then the respondent was asked to put the number of cubes into the box that represented his/her own health from the last to the current rainy season.

Another VAS was a drawn analogue of the wooden cubes and is hereafter called a drawn VAS (Fig. 2). A respondent was shown 10 cubes in a separate frame (See upper left corner in Fig. 2). The 10 cubes put together represent the best imaginable health (column 10), while no cubes (column 0) represent the worst imaginable health. The more cubes that are put together, the better one’s health. The respondent was asked to show the column that represented his/her own health from the last to the current rainy season.

Questionnaire

All instruments were included in two versions of a single questionnaire. Both questionnaires started with the SRH question. Next, half of the questionnaires had a drawn VAS followed a wooden VAS, and the other half had a wooden VAS followed by a drawn VAS. This was done to control for the potential effect of one VAS on the other.



Fig. 1. Wooden visual analogue scale.

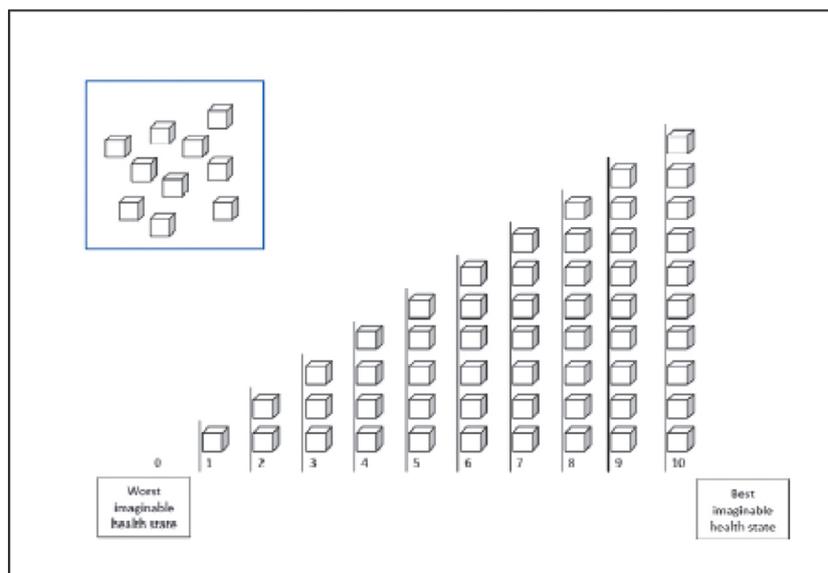


Fig. 2. Drawn visual analogue scale.

After administration of each of the three SRH instruments, respondents were asked to explain their choice of the response alternative or the number of cubes. Narratives were simultaneously recorded by the interviewer. The questionnaire finished with inquiry about respondent sex, age, ethnicity, religion, marital status, education, and literacy. The time interviewers spent explaining each VAS and time for respondents to choose an answer were recorded for each VAS.

Procedure

Following a 3-day training and pre-test period, the pilot study was conducted between August 25–27, 2009 (the rainy season). Two male interviewers with extensive experience in the Nouna annual household survey were recruited. Interviews were conducted in Dioula (a lingua franca), Dafing or Bwamu (the ethnic languages of the interviewers). The interviewers received detailed training and conducted several practice interviews under the observation of the supervisors (three first authors) before starting study interviews. One supervisor followed the interviewers during the first study day to observe their techniques of presenting and explaining the three SRH instruments. Mistakes were discussed and corrected after each interview.

Analysis

Qualitative data, i.e. brief narratives explaining respondent choice of SRH response alternatives or number of cubes, were translated into English and studied with content analysis technique. This method aims at understanding the content close to the text and interpreting the underlying meaning of the studied phenomena on a more abstract level (31). Meaningful units of text were

identified and assigned codes in each narrative. Thereafter, abstract labels that group the content with shared commonality were conceptualized into categories.

The correlation between the instruments was tested with the Spearman correlation test. The SRH distribution was explored stratified by respondent background characteristics of sex, age, ethnicity, religion, marital status, education, literacy, and presence of chronic diseases (the latter data were obtained from the 2008 household survey). The Pearson chi-square test was used to establish significant differences ($p < 0.05$). Interviewer effect on respondent answers to the three SRH instruments was analyzed in the same way. The STATA software package (32) was used for all statistical analyses.

Ethical approval

The ethical approval was received from the Nouna Ethical Committee, Burkina Faso.

Results

Background characteristics of the sample are presented in Table 1. The sample represented the Nouna adult population (33) although the size of the ethnic groups were purposefully made equal. There were slightly fewer women than men, and fewer older than younger adults. The majority of the respondents were Muslim, married, and had low or no education. The majority reported their health as very good or good and chose eight or more cubes on the VAS to describe their health (Table 2).

Narratives: interpreting the self-reported health

The narratives were brief and consisted of one or two sentences that explained the response choice to the SRH question or number of cubes on the VAS. Although the

Table 1. Background characteristics in the study sample

Characteristic	Level	Number	Percentage
Sex	Men	27	51.9
	Women	25	48.1
Age (years)	18–29	15	28.9
	30–39	13	25.0
	40–49	11	21.2
	50–59	6	11.5
	60+	7	13.5
Ethnicity	Dafing	10	19.2
	Bwaba	10	19.2
	Mossi	10	19.2
	Samo	12	23.1
	Peulh	10	19.2
Religion	Muslim	34	65.4
	Catholic	17	32.7
	Other	1	1.9
Marital status	Married	35	67.3
	Single, divorced, or widowed	11	21.2
	Missing	6	11.5
Education	University or secondary	9	17.3
	Primary	9	17.3
	Self-educated	10	19.2
	None	18	34.6
	Missing	6	11.5
Literate (Reading)	Yes	29	55.8
	No	18	34.6
	Missing	5	9.6
Literate (Writing)	Yes	29	55.8
	No	18	34.6
	Missing	5	9.6
Chronic disease* (2008)	No	34	65.4
	Yes	13	25.0
	Missing	5	9.6

*Self-reported information on medically registered chronic conditions was obtained from the 2008 household survey

word ‘keneya’ is all-inclusive and refers to multiple health dimensions, the respondents mainly mentioned the physical component of health. One’s own health was assessed in terms of the presence or absence of a disease or illness. The mere presence of disease or illness was not necessarily associated with poor health. Disease or illness periodicity (seldom/often), duration (short/long), how recent it occurred, functional abilities (able to walk or in the bed, able to work on not) and the number of episodes of disease or illness during the past year were

crucial to SRH assessment. The severity of symptoms and the diagnosis (e.g. common illnesses such as a running nose, cough, headache or a serious health problem such as asthma, typhus, sickle cell anemia, vision problems, heart pain, back pain). Respondents who had a more holistic view of their health also reflected upon their age and lifestyle when evaluating their health.

The following main categories of health could be defined: ‘perfect health’, ‘good health’, ‘incomplete health’, and ‘health problems’. These were named with citations from the narratives. ‘Perfect health’ meant to be free of disease and health problems, interrupted only with insignificant illnesses or discomforts as colds or headaches. Individuals who belong to the ‘good health’ group believed that perfect health was impossible as small illnesses were unavoidable even though they were easy to manage and did not hinder work. Although the second group was similar to the first, they assigned more weight to the same small illnesses that the former disregarded. Individuals belonging to the ‘incomplete health’ group were currently or often ill, but their disease or illness, although more serious than a regular cold or headache, either did not hinder them from work or was treated promptly. Finally, individuals with long-standing disease, in deteriorating health or in need of hospital care referred to themselves as having ‘health problems’.

Correlation between the SRH instruments

Correlation between the two VAS scales was 0.89. However, correlations between the SRH question and the VAS were low: 0.60 with the wooden VAS and 0.64 with the drawn VAS. There were respondents, herewith referred to as outliers, who rated their health in some way, but chose a number of cubes that did not correspond. For example, one individual with recently improved health assessed his health as good but chose a low number of cubes. Another outlier reported fair health, but chose nine cubes on both VAS. Some took the VAS literally and subtracted the number of diseases or illnesses they had from ‘full health’, i.e. 10 cubes. For example, an individual with good health by SRH response chose seven cubes because of three illnesses during the past year (i.e. $10 - 3 = 7$).

In general, the number of cubes (wooden or drawn) corresponded to the chosen SRH category. Ten cubes corresponded to very good health, 8–9 cubes corresponded to good health, 6–7 cubes corresponded to fair health, and 3–5 cubes corresponded to bad health. Moreover, the VAS also corresponded to the four health categories defined through content analysis of the narratives. This is presented in Table 3.

Table 2. Distribution of answers to the three self-reported health instruments

SRH question		Wooden VAS*		Drawn VAS*	
Response alternatives	Number (%)	Number of cubes	Number (%)	Number of cubes	Number (%)
Very bad	0 (0%)	1	0 (0%)	1	0 (0%)
Bad	4 (7.7%)	2	0 (0%)	2	0 (0%)
Fair	16 (30.8%)	3	1 (1.9%)	3	1 (1.9%)
Good	29 (55.8%)	4	2 (3.9%)	4	3 (5.7%)
Very good	3 (5.8%)	5	9 (17.3%)	5	9 (17.3%)
		6	5 (9.6%)	6	3 (5.8%)
		7	6 (11.5%)	7	7 (13.5%)
		8	13 (25.0%)	8	13 (25.0%)
		9	7 (13.5%)	9	9 (17.3%)
		10	9 (17.3%)	10	7 (13.5%)

*Where 1 cube represents the worst imaginable and 10 cubes represent the best imaginable health

Prevalence of poor SRH

For the analyses, poor SRH was defined using ‘fair’ or ‘bad’ responses to the SRH question and seven or fewer cubes on VAS (see Table 3).

The prevalence of poor SRH assessed by SRH was 38.5%. There was a significant interviewer effect; one interviewer had a better distribution of answers among the SRH response alternatives than the other interviewer. Among the 25 respondents to the first interviewer, 12 (48.0%) reported poor SRH. Among the 27 respondents of the second interviewer, only 8 (29.6%) reported poor SRH.

The prevalence of poor SRH assessed by either VAS was 44.2%. On average, the wooden VAS took 2.59 min and the drawn VAS took 2.35 min to explain and have answered. Although the time difference was marginal, the interviewers found the drawn VAS easier to administer. There was no interviewer effect on the time or responses given.

Due to the small sample size, results of further analyses were non-significant and did not allow conclusions about the validity of the SRH question or the VAS (Table 4). As expected, older people had poorer SRH than younger individuals (except for the oldest age group), singles had poorer SRH than those who were married, and individuals with chronic diseases had poorer SRH than the individuals without them. However, unexpectedly, men had poorer SRH than women, literate individuals and those with higher education had poorer SRH than their counterparts. Moreover, there was a discrepancy between the prevalence of poor SRH assessed by the SRH question and both VAS instruments. The VAS estimated higher prevalences of poor SRH in women, adults aged 40–59 years, those of Samo ethnicity, singles, individuals without education, the illiterate, and respondents with chronic diseases compared with the SRH question.

Discussion

Three tested SRH instruments generated slightly different results. With the SRH question, the prevalence of poor SRH was 38.5%. SRH was 44.2% with either VAS. This was higher than the prevalences of 3.5% in 2000 and 8.5% in the 2008 Nouna household surveys that utilized non-adapted SRH questions. They were also higher than the prevalence of 28.9% among adults aged 18 years and older in a WHS random sample from the entire population of Burkina Faso (19). There are two possible explanations to the higher rates in this pilot: either the SRH instruments were more culturally sensitive whether administered as the SRH question or the VAS, or they overestimated the prevalence of poor SRH. While we cannot undoubtedly reject the latter hypothesis, the evidence suggests that the former hypothesis is true. The adaptation of the SRH question with a clear time anchoring, careful translation, testing of multiple alternatives, and development of a special technique for asking the SRH question, allowed for studying the general health of the individuals.

Analysis of the narratives confirmed that the question used to study SRH was culturally sensitive and clearly understood by the respondents. Our respondents evaluated both the past and the present, but focused predominantly on physical health, as respondents in the studies elsewhere have done (34, 35). In their evaluations, they reflected upon whether they had ‘health problems’, ‘incomplete health’, ‘good health’ or ‘perfect health’ and this corresponded with the SRH response alternatives of ‘bad’, ‘fair’, ‘good’, and ‘very good’. This illustrates that the SRH question and its response alternatives were clear and applicable for all individuals.

In contrast, the 10 cubes of each VAS instrument were not as clear. Some individuals misunderstood the task (e.g. ‘I put 10 cubes in to show that I can.’), or mathematically derived the answer by subtracting

Table 3. Interpretation of health ratings

SRH question	Explanation (narratives)	VAS*
Very good	Perfect health No health problems, no diseases or illnesses '100% health' Sometimes 'insignificant' illness or discomfort (e.g. cold, headache)	10
Good	Good health Not perfect health 'Perfect health is impossible' Minor illness sometimes, not serious Can work Does not require hospital	8–9
Fair	Incomplete health Currently or often ill Can work Cannot work (but can be treated quickly)	6–7
Bad	Health problems Long-standing disease, 'serious disease' Needs hospital care Deteriorating health Not good health in general, 'defective health'	3–5
Very bad	No responses	–

*Applies to both wooden and drawn visual analogue scale (VAS)

their episodes of disease or illness from the 'perfect health' represented by 10 cubes. Only on the aggregated level, could the four categories be identified: 10 cubes representing 'perfect health', 8–9 cubes signifying 'good health', 6–7 cubes indicating 'fair health', and 3–5 cubes symbolizing 'bad health'. Due to outliers, this categorization was not fully applicable on the individual level. Another limitation of the VAS was administration time. Administration of the SRH question takes an average of 15 seconds (11), and both VAS required almost 3 min in this study. This time loss is significant in both research and in clinical practice settings.

The specific methodology of asking the SRH question had a substantial effect. One interviewer received a wider range in SRH answers than the other interviewer. The first interviewer may have been better at asking respondents to specify how good or bad their health was. We think this approach is important in order to avoid normative answers. Different cultures are known to have different images of 'normal' health (8) and consequently, the normative answer to the SRH question is 'good' in some cultures and 'bad' in others (36). A normative answer may not correspond with the respondent's actual health as evaluated by a physician (37). When asked about their health in surveys or casual conversation, Nouna residents usually give the normative

positive answer 'good'. To avoid this answer, we found it important to ask the respondent to specify their health as: 'very good', 'good', or 'fair'. In the cultures where the normative answer is 'bad' it might be advisable to ask whether health is 'fair', 'bad', or 'very bad'. This increases administration time of the SRH question but only by a few seconds. Unfortunately, no documentation was made to provide clear evidence of the effectiveness of this technique.

Earlier studies report wide discrepancies in responses across various cultures to different scales and conclude that attitude measures such as the Likert scale are 'culture specific, emic instruments' that largely depend upon respondent interpretation of the measures (38). Other techniques have been developed to account for the influence of culture in self-reports. Anchoring vignettes (39) is an example of such and is currently being analyzed in a number of low- and middle-income countries of Africa and Asia within the WHO SAGE study (14). Their results might provide guidance on improvement of methods to study self-reported health in the future.

Culturally adapted VAS have also been suggested as alternative instruments to measure health states in settings where formal education is low (29). In this pilot study, we tested both a culturally adapted SRH question

Table 4. Prevalence of poor self-reported health by different self-reported health instruments

Characteristic*	Level	SRH question <i>n</i> (%)	Wooden VAS <i>n</i> (%)	Drawn VAS <i>n</i> (%)
Sex	Men	13 (48.2%)	14 (51.9%)	14 (51.9%)
	Women	7 (28.0%)	9 (36.0%)	9 (36.0%)
Age (years)	18–29	5 (33.3%)	5 (33.3%)	5 (33.3%)
	30–39	4 (30.8%)	4 (30.8%)	4 (30.8%)
	40–49	5 (45.5%)	6 (54.6%)	6 (54.6%)
	50–59	3 (50.0%)	5 (83.3%)	5 (83.3%)
	60+	3 (42.9%)	3 (42.9%)	3 (42.9%)
Ethnicity	Dafing	4 (40.0%)	3 (30.0%)	3 (30.0%)
	Bwaba	5 (50.0%)	5 (50.0%)	5 (50.0%)
	Mossi	3 (30.0%)	3 (30.0%)	3 (30.0%)
	Samo	3 (25.0%)	7 (58.3%)	7 (58.3%)
	Peulh	5 (50.0%)	5 (50.0%)	5 (50.0%)
Religion	Muslim	12 (35.3%)	15 (44.1%)	15 (44.1%)
	Catholic	7 (41.2%)	7 (41.2%)	7 (41.2%)
	Other	1 (100.0%)	1 (100.0%)	1 (100.0%)
Marital status	Married	13 (40.0%)	14 (40.0%)	14 (40.0%)
	Single, divorced, or widowed	5 (45.5%)	7 (63.6%)	7 (63.6%)
	Missing	2 (33.3%)	2 (33.3%)	2 (33.3%)
Education	University or secondary	5 (55.6%)	6 (66.7%)	6 (66.7%)
	Primary	4 (44.4%)	3 (33.3%)	3 (33.3%)
	Self-educated	5 (50.0%)	4 (40.0%)	4 (40.0%)
	None	4 (22.2%)	8 (44.4%)	8 (44.4%)
	Missing	2 (33.3%)	2 (33.3%)	2 (33.3%)
Literacy (Reading)	Yes	14 (48.3%)	13 (44.8%)	13 (44.8%)
	No	4 (22.2%)	8 (44.4%)	8 (44.4%)
	Missing	2 (40.0%)	2 (40.0%)	2 (40.0%)
Chronic disease** (2008)	No	12 (35.3%)	12 (35.3%)	12 (35.3%)
	Yes	6 (46.2%)	9 (69.2%)	9 (69.2%)
	Missing	2 (40.0%)	2 (40.0%)	2 (40.0%)

*No significant ($p < 0.05$) differences were found

**The self-reported information on medically registered chronic conditions was obtained from the 2008 household survey

with health valuations represented on a standard Likert scale and two VAS where valuations of health were visualized by wooden or drawn cubes. Previously it was suggested that valuations represented by physical units are a more culturally appropriate approach in Burkina Faso (29). The results of this study did not allow us to draw conclusions on the advantage of one or another SRH instrument although our understanding of the specifics of health reporting in low-income settings was increased. While wooden and drawn VAS may be used interchangeably (correlation 0.89), the SRH question could not be replaced by either VAS (correlation 0.60–0.64). It is plausible that the VAS measured different aspects of SRH in spite of being based on the same question.

This pilot aimed at developing and testing a culturally sensitive instrument to study SRH in the given setting. The studying of the validity of the SRH question and either of the VAS instruments was not among the objectives of this pilot and could not be established because of the small sample size. However, the analyses provide some evidence that SRH is associated with age, marital status, and chronic diseases (non-significant) as in high-income countries. Unexpectedly, sex, education, and literacy show an inverse association with poor SRH (non-significant). Similar results on an inverse association between the education and SRH are reported in India. The phenomenon was explained as the illiterate population having a low perception of illness, because of limited awareness of diseases and their treatments (18). However,

other studies show that the main determinants of poor SRH, particularly education (16), are uniform across countries and cultures (9).

Self-reported health potentially has a high value for both public health research and clinical practice in high-income as well as low-income countries. SRH reflects an individual's awareness of symptoms, diagnoses, and performance decrements that are associated with mortality risk (40). Moreover, evidence suggests that preclinical feelings of sickness manifest as poor SRH before medical identification of illness (41, 42). A study in Zambia (43) shows that undiagnosed HIV is associated with poorer SRH in infected persons aged 25 years or older. Thus, SRH is a sensitive indicator of health-related changes (43) and might be a better predictor of mortality than objective measures of health status (8, 9, 12, 13).

There is insufficient knowledge on the extent to which cultural beliefs and communication traditions affect self-reporting of health. Culture may affect the way people report their health. For example, social norms that differ between cultures, such as the norms for expressing ill health in public or superstitions concerning talking about one's health may affect SRH (44). Therefore, interpretation of SRH study results remains unclear, and whether results are comparable between or within the countries is uncertain. This hinders improvement of knowledge about public health and its development and determinants, especially in low-income countries where the information is crucial. Therefore it is essential to continue exploring this health measurement in order to gain additional understanding and knowledge.

We developed and tested a new version of the SRH question that may be more culturally sensitive than its non-adapted equivalents. We also received insight into the Burkina Faso population's understanding and reporting of health. To further understand which instrument is best suited to study SRH in the low-income setting of semi-rural Burkina Faso, and to assess instrument validity and reliability, a test of both the SRH question and one of the VAS is recommended in a larger sample. This is to be the second step of the series of studies exploring the use of the SRH as a clinical risk indicator in everyday West African health care, which commenced with this pilot.

Conclusion

National surveys in low-income countries increasingly rely on self-reported measures of health. The ease, speed, and economy of collecting SRH make such collection attractive for rapid appraisal and assessment of epidemiologic associations between various exposures and health. This is especially true in countries lacking objective health data (16). The interpretation of these measures is complicated by cultural implications, i.e. understanding and responding to the same question in

different ways (25). This pilot study provides insight into health evaluation and health reporting of the adult residents of the semi-rural Nouna, Burkina Faso. A culturally sensitive question was developed to study SRH and tested with three instruments: a single SRH question and two VAS. A specific methodology allowed increased sensitivity of the SRH question. The validity and the reliability of the instruments remain to be established in further studies.

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References

1. de Bruin A, Picavet HSJ, Nossikov A (1996). Health interview surveys. Towards international harmonization of methods and instruments. WHO Regional Publications European Series, No. 58. Geneva: WHO.
2. Manderbacka K, Lundberg O, Martikainen P. Do risk factors and health behaviors contribute to self-ratings of health? *Soc Sci Med* 1999; 48: 1713–20.
3. Lundberg O, Manderbacka K. Assessing reliability of a measure of self-rated health. *Scand J Soc Med* 1996; 24: 218–24.
4. Idler EL, Hudson SV, Leventhal H. The meanings of self-ratings of health. A qualitative and quantitative approach. *Res Aging* 1999; 21: 458–76.
5. Fayers PM, Sprangers MAG. Understanding self-rated health. *Lancet* 2002; 359: 187–8.
6. Burstrom B, Fredlund P. Self-rated health: is it as good a predictor of subsequent mortality among adults in lower as well as in higher social classes? *J Epidemiol Community Health* 2001; 55: 836–40.
7. Gerber Y, Benyamini Y, Goldbourt U, Drory Y. Prognostic importance and long-term determinants of self-rated health after initial acute myocardial infarction. *Med Care* 2009; 47: 342–9.
8. Idler EL, Benyamini Y. Self-rated health and mortality: a review of twenty-seven community studies. *J Health Soc Behav* 1997; 38: 21–37.
9. DeSalvo KB, Fan VS, McDonell MB, Fihn SD. Predicting mortality and healthcare utilization with a single question. *Health Serv Res* 2005; 40: 1234–46.
10. DeSalvo KB, Jones TM, Peabody J, McDonald J, Fihn S, Fan V, et al. Health care expenditure prediction with a single item, self-rated health measure. *Med Care* 2009; 47: 440–7.
11. DeSalvo KB, Fisher WP, Tran K, Blosner N, Blosner N, Merrill W, et al. Assessing measurement properties of two single-item general health measures. *Qual Life Res* 2006; 15: 191–201.
12. Mossey JM, Shapiro E. Self-rated health: a predictor of mortality among elderly. *Am J Public Health* 1982; 72: 800–8.
13. LaRue A, Bank L, Jarvik L, Hetland M. Health in old age: how do physicians' ratings and self-ratings compare? *J Gerontol* 1979; 34: 687–91.
14. Tollman SM, Kahn K, Ng N, eds. Growing older in Africa and Asia: multicentre study on ageing, health and well-being, An

- INDEPTH WHO SAGE collaboration. *Glob Health Action* 2010; Suppl 2. DOI: 10.3402/gha.v3i0.5442
15. Razzaque A, Nahar, L, Akter Khanam M, Kim Streatfield P. Socio-demographic differentials of adult health indicators in Matlab, Bangladesh: self-rated health, health state, quality of life and disability level, *Global Health Action Supplement 2*, 2010; DOI: 10.3402/gha.v3i0.4618.
 16. Subramanian SV, Huijts T, Avendano M. Self-reported health assessments in the World Health Survey: how do they correlate with education? *Bull World Health Organ* 2010; 88: 131–8.
 17. Debpuur C, Welaga P, Wak G, Hodgson A. Self-reported health and functional limitations among older people in the Kassena-Nankana District, Ghana. *Global Health Action Supplement 2*, 2010; DOI: 10.3402/gha.v3i0.2151.
 18. Sen A. Health: perception versus observation. *BMJ* 2002; 324: 860–1.
 19. WHO. World Health Survey. Available from: <http://www.who.int/healthinfo/survey/en/index.html>; <http://surveydata.who.int/data.html> [cited 6 Jan 2011].
 20. Murray CJ, Chen L. Understanding morbidity change. In: Chen L, Kleinman A, Ware NC, eds. *Health and social change in international perspective*. Boston: Harvard University Press; 1994, pp. 87–114.
 21. Diaz E, Bruce N, Pope D, Diaz A, Smith KR. Smith-Sivertsen, Self-rated health among Mayan women participating in a randomised intervention trial reducing indoor air pollution in Guatemala. *BMC Int Health Hum Rights* 2008; 8: 7.
 22. Rahman MO, Barsky AJ. Self-reported health among older Bangladeshis: how good a health indicator is it? *Gerontologist* 2003; 43: 856–63.
 23. Lindeboom M, van Doorslaer E. Cut-point shift and index shift in self-reported health. *J Health Econ* 2004; 23: 1083–99.
 24. Lee S, Grant D. The effect of question order on self-rated general health status in a multilingual survey context. *Am J Epidemiol* 2009; 169: 1525–30.
 25. Salomon JA, Tandon A, Murray CJ. Comparability of self rated health: cross sectional multi-country survey using anchoring vignettes. *BMJ* 2004; 328: 258.
 26. Würthwein R, Gbangou A, Kouyaté B, Mugisha F, Ye Y, Becher H, et al. The Nouna health district household survey – design and implementation. Heidelberg: University of Heidelberg; 2001. SFB 544 Discussion Paper.
 27. Hasson D, Arnetz BB. Validation and findings comparing VAS vs. Likert scales for psychosocial measurements. *Int Electron J Health Educ* 2005; 8: 178–92.
 28. Akunne AF, Bridges J, Sauerborn R. Visual analogue scales: are the elicited preferences analogue? *Value Health* 2004; 7: 773.
 29. Baltussen RM, Sanon M, Sommerfeld J, Wurthwein R. Obtaining disability weights in rural Burkina Faso using a culturally adapted visual analogue scale. *Health Econ* 2002; 11: 155–63.
 30. US Department of State Bureau of African Affairs. <http://www.state.gov/r/pa/ei/bgn/2834.htm> [cited 13 July 2011].
 31. Graneheim UH, Lundman B. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Educ Today* 2004; 24: 105–12.
 32. StataCorp. *Stata Statistical Software: Release 10.1*. College Station, TX: Stata Corporation; 2009.
 33. Sie A, Louis VR, Gbangou A, Muller O, Niamba L, Stieglbauer G, et al. The health and demographic surveillance system (HDSS) in Nouna, Burkina Faso, 1993–2007. *Global Health Action* 2010; 3: 5284. DOI: 10.3402/gha.v3i0.5284
 34. Simon JG, De Boer JB, Joung IM, Bosma H, Mackenbach JP. How is your health in general? A qualitative study on self-assessed health. *Eur J Public Health* 2005; 15: 200–8.
 35. Krause NM, Jay GM. What do global self-rated health items measure? *Med Care* 1994; 32: 930–42.
 36. Appels A, Bosma V, Grabauskas A. Self-rated health and mortality in a Lithuanian and a Dutch population. *Soc Sci Med* 1996; 42: 681–9.
 37. Angel R, Guarnaccia P. Mind, body and culture: somatization among Hispanics. *Soc Sci Med* 1989; 28: 1229–38.
 38. Yu JH, Keown CF, Laurence W. Attitude scale methodology: cross-cultural applications. *J Int Consumer Market* 1993; 6: 45–63.
 39. Salomon JA, Tandon A, Murray CJ. Comparability of self-rated health: cross sectional multi-country survey using anchoring vignettes. *BMJ* 2004; 328: 258.
 40. Yu ES, Kean YM, Slymen DJ, Liu WT, Zhang M, Katzman R. Self-perceived health and 5-year mortality risks among the elderly in Shanghai, China. *Am J Epidemiol* 1998; 147: 880–90.
 41. Froom P, Melamed S, Triber I, Ratson NZ, Hermoni D. Predicting self-reported health: the CORDIS study. *Prev Med* 2004; 39: 419–23.
 42. Eriksson I, Uden AL, Elofsson S. Self-rated health. Comparisons between three different measures. Results from a population study. *Int J Epidemiol* 2001; 30: 326–33.
 43. Siziya S, Fylkesnes K. Impact of HIV infection on self-rated health in a high-prevalence population with low awareness of own HIV status. *Norsk Epidemiologi* 2005; 15: 165–73.
 44. Baron-Epel O, Kaplan G, Haviv-Messika A, Green MS, Kaluski DN. Self-reported health as a cultural health determinant in Arab and Jewish Israelis. *MABAT – National Health and Nutrition Survey 1999–2001*. *Soc Sci Med* 2005; 61: 1256–66.

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